
i-STS

HTTP Web Interface User Manual

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DOCUMENT HISTORY

1/05/2014	Version 2.0.4 Original Specification for LAN capabilities of Static Power PTY LTD STS units. <i>Author Arman Motamed Ektesabi.</i>
1/09/2014	Version 2.1.0 Added Email Notification Section. <i>Author Lucas Chenco.</i>
30/03/2015	Version 2.1.1 Revised default IP address. <i>Author Lucas Chenco.</i>

INTRODUCTION

The LAN support on this *i*-STS product is used to remotely access information of the device and change settings of each unit. LAN support is available on all models except the Model A STS.

This document outlines in their own sections:

- Connection to network/PC
- Connection to web server

CONNECTION

Connecting to the LAN interface can be done two different ways with a RJ45 Cat5 Ethernet cable:

- To a Network hub/switch using a straight-through cable.
- To a PC using a cross-over cable. (Most PCs can now work with a straight-through cable)

The LAN cable should be connected to the LAN port firmly until a small click is heard; the LAN port on *i*-STS products clearly labelled on each device, refer to the user manual to for the specific device to find the exact locations.

CONNECTION TO A NETWORK

By default the STS uses DHCP to get assigned its IP information automatically after the Ethernet cable is plugged in at both ends, this process can take up to several seconds to complete. If your network does not have a DHCP server or if you wish to use a static IP, it can be achieved by changing settings on the “Communications Settings” screen of the LCD equipment described below. For units without LCD screens, static IP can also be gained by changing settings in the “control” panel of the Web server.

STATIC IP

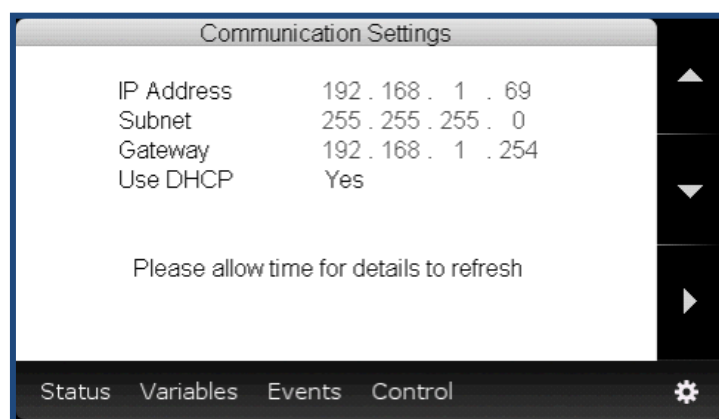


Figure 1: Communication Settings

The page in Figure1 can be used to view the IP address when using DHCP, this page can also be used to achieve Static IP.

USING THE LCD TO CREATE STATIC IP:

Units with LCD Touch Screens:

If static IP is desired then with the use of arrow keys on the LCD touch screen navigate to the “use DHCP” option, this is originally set to “yes” which is DHCP mode, this should be set to “No” which changes the settings from DHCP to Static IP; after this action has taken place the rest of the options on the page become available to change, these settings can now be set to the desired values. The page in Figure1 can be found inside the settings  page, located in the communications tab.

Units with LCD and Buttons:

To get Static IP for non LCD touch screen units, the buttons on the unit can be used to scroll the menus and select the desired settings. Scroll through the menus and change “IP assignment” from “DHCP” to “Static IP”, this in turn allows for the IP to become static, now the “IP address”, “subnet” and “gateway” can be changed to their desired values.

CONNECTION TO A PC

When connecting directly to a PC, both the STS and PC must have statically assigned IP addresses on the same subnet. Set the STS’s IP in the communications screen described above. By default this is IP: 192.168.1.2 with Mask: 255.255.255.0

To set your PC’s IP address in Windows 7 navigate to: ‘Network and Sharing Centre’ → ‘Change adapter settings’, right-click the network interface → ‘Properties’. Select ‘TCP/IPv4’ → ‘Properties’. Change the appropriate values as shown blow and click on OK, you soon should be connected to your device.

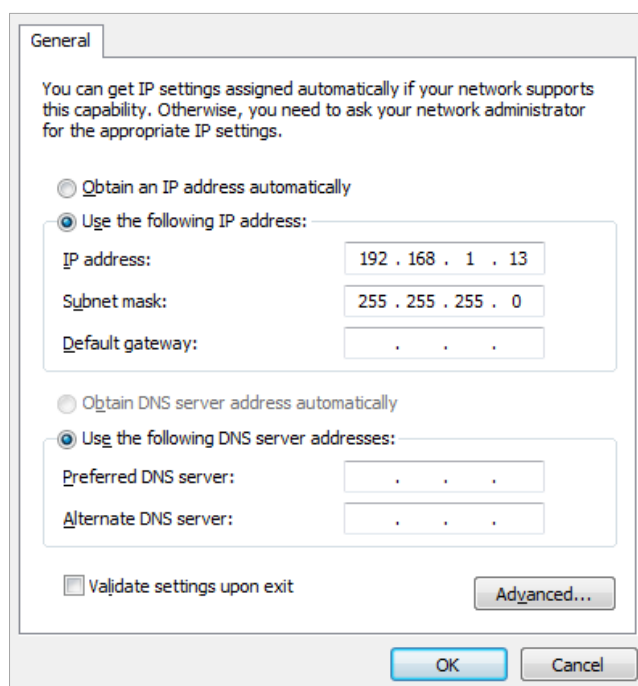


Figure 2: TCP/IPv4 Properties

For other operating systems, please refer to the OS network manual.

CONNECTION TO THE WEB SERVER

A ping test can be used to confirm the connection; this can be done on a PC with the command prompt (CMD). Once opened typing ping (space) then the IP address of the device.

Entering the IP address into the web browser should bring up the web server homepage. If the DHCP /address have not yet been registered on your network you may need to remove the cable for 5 to 10 seconds and reconnect the cable, this in turn should re-register the device on the network. Once the device becomes registered you are greeted with the devices homepage.

INTERFACE

HOME PAGE

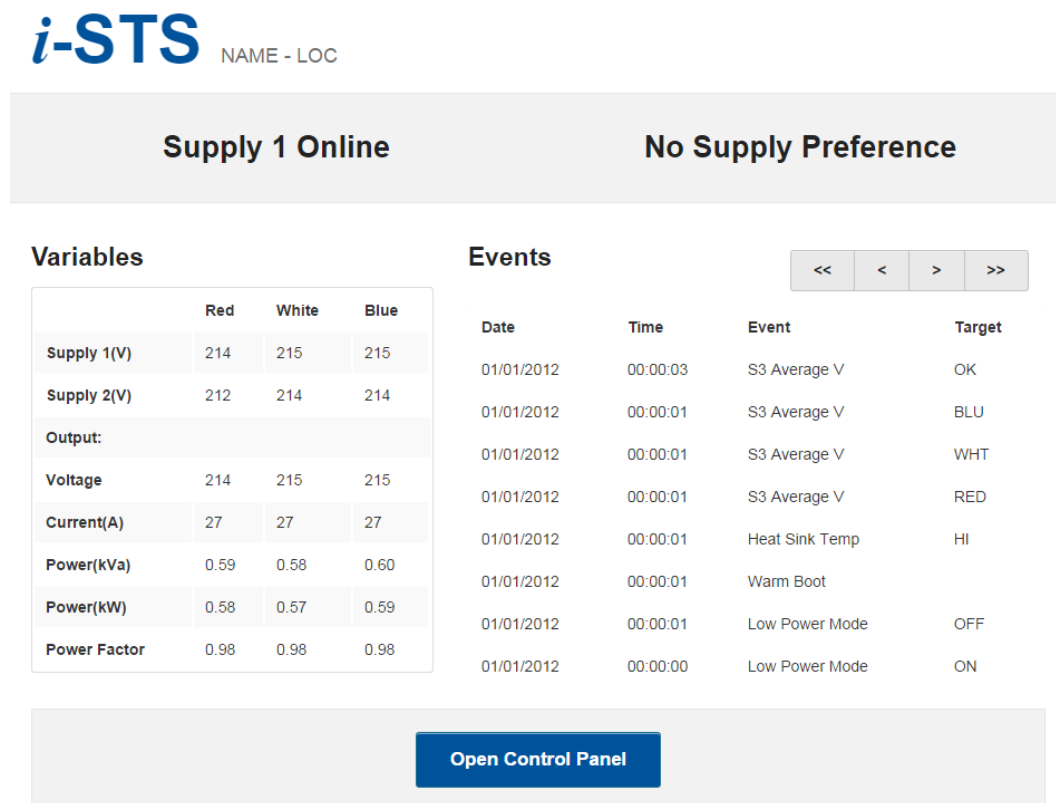


Figure 3: Web Server Home Page

The homepage is used to show the supply that the unit is on, supply preference, variables and a list of recent events that occur on the unit, this events list can be scrolled through using the arrows provided. The homepage is also used to gain access the control panel, once the "Open Control Panel" is clicked for safety, authentication is required to enter:

The details are shown below:

Username: *admin*
Password: *1234*

CONTROL PANEL

Whilst inside the control panel shown in Figure4, many more options become available such as:

- Viewing utilisation
- Ability to transfer supply
- Setting the preferred supply
- Setting the name and location information
- Adjusting the time and date
- Setting the IP address

Important: you must press update for the information to be saved inside the device

ControlEmailSettings

Utilisation

Total Hours on Supply 1	0	Number of Synchronisation Losses	0
Total Hours on Supply 2	0	No of Load Fault	0
Total Hours on Preferred Supply	0	Last Load Fault	01/01/2012 00:00:00
Total Hours in Operation	0	No of Supply Outages	0
Number of Hours with no output	0	Last supply outage	01/01/2012 00:00:00
Number of Forced Transfers	0	Model Number	

Supply

Transfer Supply ↕

Set Preferred

☒ None ☐ 1 ☐ 2

Set

Unit Details

Name:

NAME

Location:

LOC

Update

Network

DHCP: ☐ On ☒ Off

IP: 192 168 1 2

Mask: 255 255 255 0

Gateway: 192 168 1 254

Update

Time & Date

Time: 0 4 42
Hour Minute Second

Date: 1 1 2012
Day Month Year

Update

Figure 4: Control Panel

TRANSFERRING THE SUPPLY

Clicking on the “Transfer Supply” will change the supply that the unit is currently using, if the supply that it is getting changed to is a faulty supply the transfer will not occur.

PREFERRED SUPPLY

The preferred supply can easily be set using the web server, there are three options, “none” where there is no preferred supply, and “1” and “2” will change the preferred supply accordingly.

UNIT DETAILS

Enter a name for the device under “name:” and the location it is stored at under “location:” this should be done so you can differentiate between the different static transfer switches.

DATE AND TIME SETTINGS

Enter and check the date and time. (This should only be required one time) We strongly encourage the setting of the time and date so that the real time event correlation can be undertaken. After pressing update the details should be stored into the unit. The real time clock is thereafter backed up by a battery cell.

IP ADDRESS SETTINGS

The default settings is set to DHCP mode “on”, when this is set to “off” then the other options become available to change, from here you can change the “IP”, “Mask” and the “Gateway”, that suit you. After pressing update these details will be saved into the unit.

EMAIL

The Email tab allows you to turn on the email notification service. When a certain event occurs the unit will send an email to notify the user. The email takes the following format:

STS01 – LVL5

Supply 1 Fault - 05/05/2014 13:01:42

SETTINGS

Server Settings

This is the SMTP server that the unit will use to send the email. You need to provide the; Server Address, Server Port, User name or email, and a password.

Note: this cannot be an SSL SMTP server.

Recipient Email

This is where the email notification will be sent. It can be the same as the above email.

EMAIL LIST

In this section you can select which event types should trigger an email notification to be sent.

The screenshot shows a web interface with three tabs: Control, Email, and Settings. The Settings tab is selected. Below the tabs is a section titled 'Email Notifications' with radio buttons for 'ON' and 'OFF' (the 'OFF' button is selected), and a blue 'Set' button. Below this is a 'Settings' section with five input fields: 'Server Address' (smtp.server.com), 'Server Port' (25), 'User name / Email' (user@server.com), 'Password' (empty), and 'Recipient Email' (you@mail.com). A 'Save' button is at the bottom of the settings section. To the right is an 'Email List' section with a grid of checkboxes for various events: Input/Output Faults, Load/Current Warnings, Frequency and Synchronisation, Force/Override, Preferred Supply Change, User Transfers Warnings, Bypass, SCR/Thyristor, Heat Warnings, Power Supply Faults, Transfer Inhibit, and Breaker Changes. A 'Set' button is at the bottom of the email list section.

Figure 5: Email

ADVANCED SETTINGS

The Settings menu shown in Figure 6 can be clicked on whilst inside the control panel for more advanced settings of the unit. Once inside the settings tab you can adjust the input steady state, input transient and the output settings in detail by inserting the values in the appropriate sections and then clicking on the update.

Danger, the STS has been shipped with factory defaults. These are the most reliable settings for correct stable operation. These settings should only be changed under the certain operating conditions and it is advised that you speak to us before doing so, as wrong settings can make the system unstable and damage equipment.

The following screen shows the available options. The auto set of settings apply to the normal STS operation (unattended). The manual settings are referenced when the STS is manually operated (manual user transfer requests).

The screenshot displays a web-based settings interface for an STS unit. It features three tabs: 'Control', 'Email', and 'Settings', with 'Settings' being the active tab. The interface is divided into three main sections: 'Input Steady State', 'Input Transient', and 'Output'. Each section contains a table of settings with 'Auto' and 'Manual' columns. The 'Update' button is located at the bottom of each section.

	Auto	Manual
S1 steady state high value (%)	120	120
S1 steady state low value (%)	70	70
S2 steady state high value (%)	120	120
S2 steady state low value (%)	70	70
Steady state failure time (sec/10)		15
Phase error detection normal (deg)	10	10
Phase error detection fault (deg)	30	
Phase error detection break (ms)	50	

Update

	Auto	Manual
S1 transient high value (%)	130	130
S1 transient low value (%)	65	65
S2 transient high value (%)	130	130
S2 transient low value (%)	65	65
Transient pause time (sec)		1
Re-transfer timeout (sec)	5	
Re-transfer max attempts	3	

Update

	Auto	Manual
Output steady state high value (%)	125	125
Output steady state low value (%)	65	65
Output transient high value (%)	133	133
Output transient low value (%)	60	60
Low current warning (%)		0
High current time (minutes)	60	20
High current time (secs)	10	1
Transfer timer	0	

Update

Figure 6: Settings

INPUT SETTINGS

S1 STEADY STATE HIGH VALUE (%)

Default value of 120%, can be changed from a nominal value of 105 to 125 this number will be set as percentage.

Averaging time constant for this parameter is defined by Steady state typically 1.5 seconds.

S1 STEADY STATE LOW VALUE (%)

Default value of 70%, can be changed from a nominal value of 0 to 95 this number will be set as percentage.

Averaging time constant for this parameter is defined by Steady state failure time typically 1.5 seconds.

S2 STEADY STATE HIGH VALUE (%)

Default value of 120%, can be changed from a nominal value of 105 to 125 this number will be set as percentage.

Averaging time constant for this parameter is defined by Steady state typically 1.5 seconds.

S2 STEADY STATE LOW VALUE (%)

Default value of 70%, can be changed from a nominal value of 0 to 95 this number will be set as percentage.

Averaging time constant for this parameter is defined by Steady state failure time typically 1.5 seconds

STEADY STATE FAILURE TIME (SEC/10)

Default value of 15, this value will be divided by 10 making the value of 1.5seconds get stored into the machine.

This is the time that the steady state value needs to be outside the limit values before the fault condition is determined to be true.

If this time is set to too small of a value it can cause erratic operation.

PHASE ERROR DETECTION NORMAL (DEG)

Setting limit is 0 to 180 degrees; the set default is 10 degrees Phase margin in electrical degrees for which a normal user initiated, no-break transfer can be achieved. Pushbutton requests when the angle is greater than the set value for the phase error detection will be ignored. If however, the supplies are continually varying because the sources are operating at different frequencies, as long as the difference in both of the frequencies are within the 5% (2.5Hz) threshold, pressing and holding the pushbutton for 4 second. This action will sent a transfer request which will be processed when the two supplies come within the set limit, whilst the transfer request will then be processed. If however,

the supplies do not come back into synchronism within 60 seconds the user's request, the action will be cancelled and the transfer will not occur.

Although the setting limit can be set from 0 to 180 degrees the consequence of transfer, when asynchronous may result in a non seamless transfer for the critical load. Ferromagnetic devices will saturate and draw large current when out of synchronism transfers are undertaken. The effect on some switch mode power supplies is also unknown. The user should consult with the equipment manufacturer to ensure that damage does not result from out of synchronisation transfers and what their recommended synchronization limits are.

When set to "0" disables the transfer pushbutton operation.

If the programmed value in the "Auto" column is exceeded no action takes place. Refer to "Phase Error Detection Fault"

PHASE ERROR DETECTION FAULT (DEG)

Automatically initiated transfers due to supply source / output supply faults when a transfer to the alternate source is necessitated. The recommended default is 30 degrees. Up until this value transfers that are initiated from the system (except manually) will occur without a break. Once the displacement between the two phases is more than this value (30 degrees) a break as defined by "Phase Break" is inserted. Settings can be from 0 to 180 degrees.

The application of inserting a break when the two supplies are significantly out of synchronism has been established to prevent the inadvertent damage to equipment, tripping of protection devices or opening of fuses that could result from over fluxing of transformers, misfiring of switch mode power supplies. The philosophy is that it is better to allow the equipment to shutdown orderly and re-power up normally rather than under fault conditions. The minimal value would be considered at 50 msec.

PHASE ERROR DETECTION BREAK (MS)

Setting of "0" inserts no-break 10 – 150 msec with resolution of 10 msec. These are typical break insertion times; additional time would be added as a result of thyristor turn-off delays.

INPUT TRANSIENT

S1 TRANSIENT HIGH VALUE (%)

Default value of 130%, can be changed from a nominal value of 108 to 135 this number will be set as percentage.

Transient time constant for this parameter is defined by "transient over-sampling time constant 2 x 330 micro sec".

S1 TRANSIENT LOW VALUE (%)

Default value of 65%, can be changed from a nominal value of 0 to 95 this number will be set as percentage.

Transient time constant for this parameter is defined by “transient over-sampling time constant 2 x 330 micro sec”.

S2 TRANSIENT HIGH VALUE (%)

Default value of 130%, can be changed from a nominal value of 108 to 135 this number will be set as percentage.

Transient time constant for this parameter is defined by “transient over-sampling time constant 2 x 330 micro sec”.

S2 TRANSIENT LOW VALUE (%)

Default value of 65%, can be changed from a nominal value of 0 to 95 this number will be set as percentage.

Transient time constant for this parameter is defined by “transient over-sampling time constant 2 x 330 micro sec”.

TRANSIENT PAUSE TIME (SEC)

This is the transient times that the values need to be outside the limit values before a fault condition is determined to be true.

RE-TRANSFER TIMEOUT (SEC)

This parameter defines the delay before a re-transfer back to the original preferred source occurs after the fault has been cleared and the source has returned to normal steady state conditions.

This parameter is usually set to 1 second. If set to too small a value an unstable condition could result because the source response time is similar to the re-transfer time and the source has not been given enough time to recover.

RE-TRANSFER MAX ATTEMPTS

This setting refers to the number of times the device will transfer back to the preferred source will be attempted. A lock out results after this but is re-set on new fault alarm condition.

A setting of “0” inhibits re-tries even when preferred source is set a transfer when initiated will not result in a transfer back to the preferred.

NOTE adjustment may be required to the Transient values if the source supply voltages are distorted or above or below nominal. Setting too close a limit to the actual operating Steady State voltage may cause erratic Static Transfer Switch operation.

OUTPUT

OUTPUT STEADY STATE HIGH VALUE (%)

Default value of 125%, can be changed from a nominal value of 108 to 135 this number will be set as percentage.

Averaging time constant for this parameter is defined by "Steady State Pause" typically 1.5 seconds.

Set as a percentage from nominal – Default setting 125% should always set this parameter wider than the S1 & S2 steady stat high threshold. This will ensure that when there is a problem with S1/S2 event list will report correctly. S3 sensing is provided as redundant sensing for on line source S1 or S2 and in case of internal thyristor triggering fault. Operation is to transfer to the alternative source.

OUTPUT STEADY STATE LOW VALUE (%)

Default value of 65%, can be changed from a nominal value of 0 to 95 this number will be set as percentage.

Averaging time constant for this parameter is defined by "Steady State Pause" typically 1.5 seconds.

Set as a percentage from nominal – Default setting 65% should always set this parameter wider than the S1 & S2 steady stat low threshold. This will ensure that when there is a problem with S1/S2 event list will report correctly. S3 sensing is provided as redundant sensing for on line source S1 or S2 and in case of internal thyristor triggering fault. Operation is to transfer to the alternative source.

OUTPUT TRANSIENT HIGH VALUE (%)

Default value of 133%, can be changed from a nominal value of 108 to 135 this number will be set as percentage.

Transient time constant for this parameter is defined by "Transient over-sampling time constant 2 x 330 Micro Sec" Set as a percentage from nominal – Default setting 133% Should always set this parameter wider than the S1 & S2 transient high threshold. This will ensure that when there is a problem with S1/S2 event list will report correctly. S3 sensing is provided as redundant sensing for on line source S1 or S2 and in case of internal thyristor triggering fault. Operation is to transfer to the alternative source.

Also transient limits should be set outside steady state limits.

OUTPUT TRANSIENT LOW VALUE (%)

Default value of 60%, can be changed from a nominal value of 0 to 95 this number will be set as percentage.

Transient time constant for this parameter is defined by "Transient over-sampling time constant 2 x 330 Micro Sec" Set as a percentage from nominal – Default setting 60% Should always set this parameter wider than the S1 & S2 transient high threshold. This will ensure that when there is a problem with S1/S2 event list will report correctly. S3 sensing is provided as redundant sensing for

on line source S1 or S2 and in case of internal thyristor triggering fault. Operation is to transfer to the alternative source.

Also transient limits should be set outside steady state limits.

LOW CURRENT WARNING (%)

Normally set to "0", defines the minimum value for units load.

The units supplied have an output load resistor located in the maintenance bypass enclosure. Otherwise set to 2% if testing unit without being plugged into maintenance bypass (e.g. for testing). Setting to non-zero value will disable thyristor open circuit and short circuit detection until after the threshold has been reached.

HIGH CURRENT TIME (MINUTES) AT 110 & 125 % OVERLOAD

Exceeding the overload limits of 110 % for greater than 60 minutes OR 125 % for 20 Minutes will not affect the critical load and no switching occurs. It is intended as a warning that the STS is overloaded. Failure to reduce the load will cause semiconductor failures.

Consult manufacturer before setting to higher values to ensure that the unit will operate safely without failure or overheating.

HIGH CURRENT TIME (SECS) AT 150 & 200 % OVERLOAD

Exceeding the overload limits of OR 150% for 10 Minutes OR 200% for 1 Minute will not affect the critical load and no switching occurs. It is intended as a warning that the STS is overloaded. Failure to reduce the load will cause semiconductor failures.

Consult manufacturer before setting to higher values to ensure that the unit will operate safely without failure or overheating.

TRANSFER TIMER

Setting of "0" disables function

After the set period the STS will undertake a test transfer to the alternate source. After a delay the load will be returned to the original source. This function is used to test functionality and protections within the STS.



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